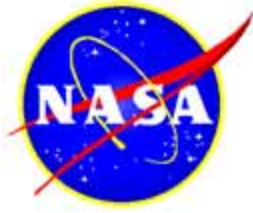


May 2000



National Aeronautics and
Space Administration

Lyndon B. Johnson Space Center
Houston, Texas 77058

HRF Flight Rack One Integration Test Procedure VI: EMI Testing

LS-71139-6A

PROJECT DOCUMENT APPROVAL SHEET			
DOCUMENT NUMBER LS-71139-6A		DATE 5/31/00	NO. OF PAGES 47
<div>HRF Flight Rack One Test Procedure VI: EMI Testing</div> <div>Approved: _____ Ed Strong NASA/SF HRF Rack Integration Manager</div> <div>_____ Date</div> <div>Approved: _____ NT3/GFE Assurance Branch</div> <div>_____ Date</div>			
DATE	PREPARED BY	CHANGE APPROVALS	CHANGE NUMBER

Report Number LS-71139-6A

Date: 5/31/00

**HRF Flight Rack One
Test Procedure VI:
EMI Testing**

Prepared by: _____
Mary Trenolone
HRF SE&I Book Manager

_____ Date

Approved: _____
Todd Leger
Sub Task Order Manager
Flight Rack Integration

_____ Date

Approved: _____
Brian Rhone
Section Manager Payload
Systems Integration

_____ Date

Approved: _____
Sharad Bhaskaran
Dept. Manager Systems Integration
and Development

_____ Date

Approved: _____
George Harvey
Section Manager, SEAT, SS, R&M

_____ Date

Prepared by
Lockheed Martin Space Operations
Houston, Texas
for
National Aeronautics and Space Administration
Johnson Space Center

REVISION/CHANGE APPROVALS

Date	Revision Letter	Change Number	Prepared By	Approved By:	
				Unit Manager	Projects Manager

DOCUMENT NUMBER LS-71139-6A		DOCUMENT CHANGE/ REVISION LOG		PAGE 1 OF 1
CHANGE/ REVISION	DATE	DESCRIPTION OF CHANGE		PAGES AFFECTED
BASIC	9/99	Baseline Issue		ALL
A	5/00	Changes made due to STEP Software upgrade Block 4.0 load.		Pgs. i, ii, iii, 1-1 thru 1-4, 2-1, 3-1,5-1 thru 5-3, 6-1 thru 6-11, A-1 thru A-6
Altered pages must be typed and distributed for insertion.				

ABSTRACT

This document provides the procedures necessary for Electromagnetic Interference (EMI) testing of the Human Research Facility (HRF) Rack. The procedure facilitates the pre and post-transportation activities involving the HRF Rack shipping container and HRF Rack handling adapter. Also provided is the hardware necessary for operation of the HRF Rack in the EMI facility along with the test set up and objectives.

The primary purpose of the EMI Testing Procedure is to outline the steps necessary for successful integration of the HRF Rack into the EMI test facility along with the essential sequences for operating and testing the HRF Rack using the Suitcase Test Environment for Payloads (STEP). The EMI Testing Procedure will be conducted in the Building 14 EMI Facility at the Johnson Space Center, Houston, Texas. A step-by-step sequence of activities to be conducted is included in Section 6.0 of this document.

A Test Readiness Review (TRR) will be held prior to the start of this activity. The TRR Board, Quality Engineering, and the Payload Test Conductor will agree to proceed with the individual tests listed in this document.

KEY WORDS

Human Research Facility
International Space Station Program

TABLE OF CONTENTS

<u>Section</u>	<u>Page</u>
1.0 <u>INTRODUCTION</u>	1-1
1.1 PURPOSE	1-1
1.2 SCOPE	1-1
1.3 DOCUMENT OVERVIEW	1-1
1.3.1 <u>Document Hand-Write Change Control</u>	1-1
1.3.2 <u>Warnings And Cautions</u>	1-2
1.3.3 <u>Task Sequencing</u>	1-2
1.3.4 <u>Repeat Operations</u>	1-2
1.3.5 <u>Discrepancies</u>	1-2
1.3.6 <u>Safety Support</u>	1-2
1.3.7 <u>Emergency/Accident Procedure</u>	1-3
1.3.8 <u>Hazardous Waste Handling</u>	1-6
 2.0 <u>APPLICABLE DOCUMENTATION</u>	 2-1
2.1 APPLICABLE SOFTWARE	2-1
 3.0 <u>TESTING PROCESS OVERVIEW</u>	 3-1
3.1 TESTING OBJECTIVE	3-1
3.2 TEST REQUIREMENTS	3-1
3.3 TEST CONDITIONS	3-1
3.3.1 <u>Test Conduct Ground Rules</u>	3-1
3.3.2 <u>Roles And Responsibilities</u>	3-1
 4.0 <u>TPS AUTHORIZED PERSONNEL</u>	 4-1
 5.0 <u>TEST SET UP</u>	 5-1
5.1 PRE-TEST ACTIVITY	5-1
5.1.1 <u>Required Equipment</u>	5-1
5.1.2 <u>Transportation of HRF Rack</u>	5-2
5.1.3 <u>Connection of GSE</u>	5-2
5.2 POST-TEST ACTIVITY	5-3
 6.0 <u>TEST PROCEDURE</u>	 6-1
6.1 HRF RACK ACTIVATION/DEACTIVATION	6-1
6.1.1 <u>Activation</u>	6-1
6.1.2 <u>Deactivation</u>	6-6
6.2 EMI TEST SCENARIOS	6-7
6.2.1 <u>HRF Rack Avionics</u>	6-8
6.2.2 <u>Workstation</u>	6-8

TABLE OF CONTENTS (CONT'D)

<u>Section</u>	<u>Page</u>
6.2.3 <u>Ultrasound</u>	6-10
6.2.4 <u>GASMAP</u>	6-10
6.2.5 <u>Cooling Stowage Drawers</u>	6-11
APPENDIX A Forms	A-1
APPENDIX B Illustrations	B-1

LIST OF TABLES

<u>Tables</u>		<u>Page</u>
5.1	REQUIRED EQUIPMENT	5-1
5.2	STEP CONNECTIONS	5-2
5.3	HRF RACK TO STEP I/O CHASSIS	5-2
5.4	RACK CONNECTIONS	5-3
6.1	HRF RACK ACTIVATION	6-1
6.2	DEACTIVATION	6-6
6.3	HRF RACK AVIONICS	6-8
6.4	WORKSTATION	6-8
6.5	ULTRASOUND	6-10
6.6	GASMAP	6-10
6.7	COOLING STOWAGE DRAWERS	6-11

LIST OF FIGURES

<u>Figure</u>		<u>Page</u>
1-1	JSC Emergency Number and Reporting Sequence	1-4
A-1	Task Performance Sheet	A-1
A-3	Discrepancy Report/Material Review Record	A-3
A-5	Discrepancy Report/Material Review Record Summary Sheet	A-5
A-6	Discrepancy Report/Material Review Record Multiple Disposition Coding Sheet	A-6
A-7	Flash Report	A-7
A-8	Disposal Inventory for Miscellaneous Hazardous Wastes	A-8
A-9	Repetitive Operations Log	A-9
B-1	EMI Test Configuration	B-1

LIST OF ACRONYMS AND ABBREVIATIONS

Assy	Assembly
C&DH	Command & Data Handling
CPU	Computer Processor Unit
DR	Discrepancy Report
EMI	Electromagnetic Interference
EXPRESS	EXpedite the PProcessing of Experiments to Space Station
GASMAP	Gas Analyzer System For Metabolic Analysis Of Physiology
GSE	Ground Support Equipment
HRF	Human Research Facility
ITCS	Internal Thermal Control System
JSC	Johnson Space Center
lbs	Pounds
MEIT	Multiple Element Integrated Test
N/A	Not Applicable
NASA	National Aeronautics and Space Administration
Ohm	Unit of Electrical Resistance
RHA	Rack Handling Adapter
RIC	Rack Interface Controller
RSC	Rack Shipping Container
STEP	Suitcase Test Environment For Payloads
TBD	To Be Determined
TPS	Task Performance Sheet
TRR	Test Readiness Review
VME	Virtual Machine Environment
VRDS	Verification Requirements Data Sheet
Wrkstn	Workstation

1.0 INTRODUCTION

1.1 PURPOSE

This document outlines the procedures necessary to transfer the HRF Rack from Johnson Space Center (JSC) Building 241 facility, into JSC Building 14 EMI test facility, and establish the baseline operating procedures to be used during EMI testing. The expected end product of this activity is the successful integration of the HRF Rack into the EMI test facility. Operation of the HRF Rack using the STEP procedures are included in this document.

1.2 SCOPE

This document provides task sequencing to satisfy the test requirements as detailed in the document "Rack One HRF Unique Payload Verification Plan" in SSP-57400, "Human Research Facility Unique Payload Verification Plan for Rack 1, International Space Station Program". The details listed herein describe the necessary hardware, configuration, test equipment set-ups, instrumentation requirements, data requirements, safety concerns, and all other details necessary to perform the appropriate procedure.

This procedure applies to the subsystems and components of the HRF Rack. It encompasses the initial integration of the payload HRF Rack into the EMI Facility, along with the HRF Rack operations to be performed by Lockheed Martin HRF personnel, and other agencies described herein.

1.3 DOCUMENT OVERVIEW

This document details the test setup, test tear down, and the necessary test operation. The procedure is divided into two (2) sections:

Section 6.1 RACK ACTIVATION/DEACTIVATION
Section 6.2 EMI TEST SCENARIOS

1.3.1 Document Hand-Write Change Control

This document is designed to present baseline procedures for EMI testing. It is therefore assumed that this document is subject to hand-write changes while in use in the test area. Hand-write entries will be controlled and documented in this procedure. All hand-writes must be approved by Quality Engineering and the Test Conductor prior to implementation. Quality Assurance will validate all hand-writes. If safety is affected, then Safety Personnel must also approve changes. The personnel that have Task Performance Sheet (TPS) signature authority are authorized to make hand-write changes to this document. Hand-written changes must be

recorded on the TPS document (See Appendix A). This document will be revised to include hand written changes.

1.3.2 Warnings And Cautions

Prior to performing any operation, test personnel must be familiar with all "General Notes, Warnings, Cautions, Special Instructions and Safety Precautions" contained in the reference documents and drawings unless otherwise specified within this procedure.

1.3.3 Task Sequencing

The procedures outlined in this document are written to ensure technical completion of a specified task and are not necessarily sequenced to provide optimum crew/tool equipment utilization or HRF Rack build-up. The work is to be accomplished sequentially, unless it is more efficient to parallel the operations. The responsible Test Conductor must first evaluate any change to assure that there is no degradation of technical requirements, system safety, personnel safety, scheduling, etc. Sequencing changes require concurrence from Quality Assurance.

1.3.4 Repeat Operations

Prior to proceeding, operations that must be repeated require approval of the Test Conductor and Quality Assurance. All repetitive operations must be documented in the Repetitive Operations Log in Appendix A.

1.3.5 Discrepancies

If any discrepancy occurs in the form of an equipment failure, hazard, or emergency, the personnel concerned will take appropriate action to ensure personnel and equipment safety, and report to a Quality Assurance Specialist. The Test Conductor will notify the National Aeronautics and Space Administration (NASA) facility manager and act as focal point for any further effort required. If required, a Discrepancy Report (DR), Johnson Space Center (JSC) form 2176 will be initiated by Quality Assurance, and will be tracked and worked as described in document NT1-ADM-013 (See Appendix A).

1.3.6 Safety Support

JSC Safety & Health Requirements established in document JPG 1700.1 Version H, will be strictly adhered to throughout all phases of test activities. All hazardous activities will be coordinated with the appropriate facility personnel.

1.3.7 Emergency/Accident Procedure

The following procedures are to be used in the event of an emergency situation, (i.e. smoke or fire) or in the case of an accident involving personal injury.

Emergency procedures provide pre-planned and approved guidelines for handling potential hardware/software malfunctions and hazardous situations. If a hazardous situation occurs, the following definitions state the actions necessary to maintain control of the situation and personnel safety. Actions required for the situations not covered by these procedures shall be provided by the Test Conductor real-time, based on his/her best judgment.

Definitions

Abort Test: Take immediate and rapid actions for restoration of safe conditions removal or rescue of test personnel, notification of the appropriate personnel about the hazardous situation, and shutdown of all systems. This action is taken in catastrophic or critical hazard conditions such as fire, smoke, or serious personnel injuries.

Terminate Test: Discontinue test per the standard shutdown procedures provided. This action is required when the situation prevents further compliance with the test objectives.

Hold and Evaluate: Maintain current test conditions or proceed to safe mode to allow time to review system status and impacts of the situation. This action is required in the event of a hardware/software malfunction.

Emergency/Accident Reporting

The Facility Engineer has the primary responsibility of initiating the notification process. General Emergency Instructions:

- (1) Sound the alarm and evacuate the area.
- (2) If safe, render/de-energize energy systems.
- (3) Initiate Flash reporting sequence (See Appendix A).
- (4) Establish emergency response team to support follow on action.

Figure 1-1 shows the JSC Emergency Number and Reporting Sequence. This number is a coordinated number for the emergency related medical, fire and security groups at JSC.

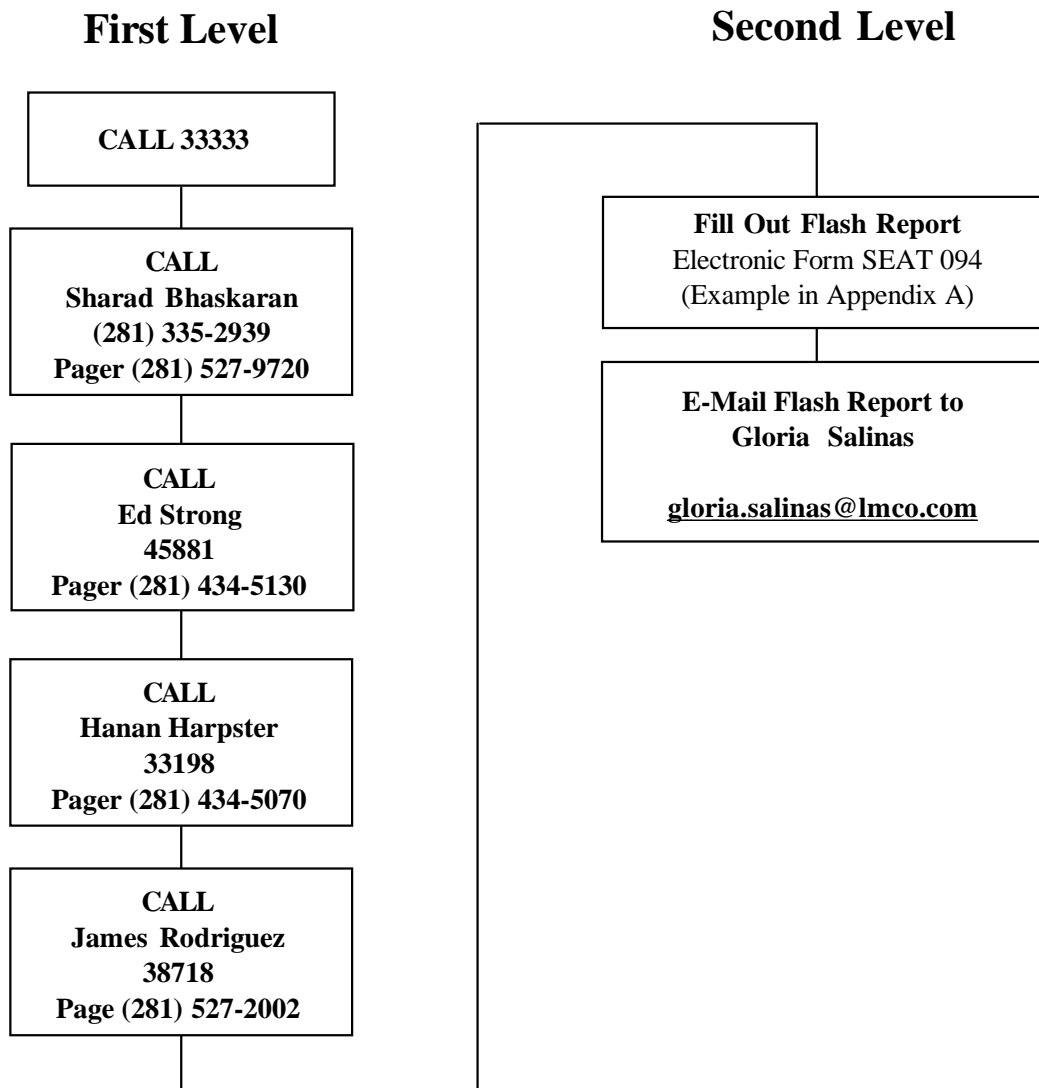


Figure 1-1 JSC Emergency Number and Reporting Sequence

Systems Emergency Procedures

The following procedures are to be carried out by the Test Conductor and Test Personnel in accordance with the condition as defined below:

CONDITION	RESPONSIBILITY	ACTION
Fire/Visible Smoke in Test Area	Test Conductor/Technician	Abort Test

- (1) Sound the alarm: Activate alarm at pull box and/or phone in emergency.
- (2) Do not move injured personnel unless necessary to prevent further injury.
- (3) If safe, attempt to de-energize system, i.e. thermal, electric, etc.
- (4) Initiate notification process. This may be conducted away from the situation from a telephone.

CONDITION	RESPONSIBILITY	ACTION
Electrical burn/smoke odor	Test Conductor/Technician	Terminate Test

- (1) Shutdown all electrical test equipment systems.
- (2) Locate nearest fire extinguisher.
- (3) Investigate/Isolate the source of odor.
- (4) If required, perform steps associated with a Fire/Smoke situation.

CONDITION	RESPONSIBILITY	ACTION
Loss of Facility Power	Test Conductor/Technician	Hold & Evaluate

- (1) Evaluate the situation and impact to the test. Investigate the cause and potential frequency of occurrence. Take appropriate steps to restore the failed systems to their nominal/safe operating conditions.

Personnel Emergency/Accident Procedures

CONDITION	RESPONSIBILITY	ACTION
Serious Personal Injury	Test Conductor/Technician	Terminate Test

- (1) To prevent further injury, do not move the injured personnel unless necessary.
- (2) Render the area safe, then administer first aid as required.
- (3) Initiate notification process.
- (4) Do not leave injured personnel alone until emergency personnel arrive.

CONDITION	RESPONSIBILITY	ACTION
Minor Personal Injury	Test Conductor/ Technician	Hold & Evaluate

- (1) Render the area safe, then administer First Aid as required.
- (2) Initiate notification process.
- (3) Take injured individual to medical treatment facility.

1.3.8 Hazardous Waste Handling

Hazardous material identification, labeling and storage shall be done according to JSC Form 1161, "Disposal Inventory for Miscellaneous Hazardous Wastes." Disposal containers, transportation and disposal will be provided by the designated JSC waste management service. All Internal Thermal Control System (ITCS) waste disposal should be coordinated through the Facility Manager.

2.0 APPLICABLE DOCUMENTATION

The following documents form a part of this Verification Plan to the extent specified. Tasks and activities referenced in pre-test, post-test, and procedural sequences may be performed using the most recent revision of the document stated.

NASA Documents:

Number	Rev.	Title
JHB 5322	C	Contamination Control Requirements Manual
JPG1700.1	H	JSC Safety & Health Requirements Handbook
KHB 1700.7	LI	Space Shuttle Payload Group Safety Handbook
LS-71135-3	A	Human Research Facility Integration Flight Prototype Rack Interface Verification Test
LS-71139-1		HRF Flight Rack One Integration Test Procedure I: Rack Handling and Processing
LS-71139-5	A	HRF Flight Rack One Integration Test Procedure V: Rack Activation/Deactivation
NT1-ADM-012	Base-line	Task Performance Sheet (TPS) NT/Occupational Safety and Institutional Assurance Division
NT1-ADM-013	A	Quality Assurance Record Center Discrepancy Reporting and Tracking Systems
SSP57400		Human Research Facility Unique Payload Verification Plan for Rack 1, International Space Program

Boeing Documents:

Number	Rev.	Title
D683-44094-2	A	Human Research Facility Flight Rack Command & Data Handling (C&DH) Acceptance Test Procedure

2.1 APPLICABLE SOFTWARE

The following software provides the configuration data used in this test setup:

HRF Rack Configurations are based upon:

Software Item	Version
Rack Interface Controller (RIC)	EXpedite the PProcessing of Experiments to Space Station (EXPRESS) Block 2 Release 3
EXPRESS Laptop	EXPRESS Block 2 Release 3

STEP Software Configurations are based upon:

Software Item	Version
STEP Sunworkstation	Block 4.0

3.0 TESTING PROCESS OVERVIEW

3.1 TESTING OBJECTIVE

The test objectives are as follows:

- Facilitate the successful transfer of the HRF Rack into the JSC Building 14 EMI test facility.
- Establish the operating procedure for the HRF Rack with the STEP.
- Conduct HRF Rack and payload operations necessary for EMI test scenarios.

3.2 TEST REQUIREMENTS

The following paragraphs describe the requirements of the specific tests to be conducted and may include references to the specific Verification Requirements Data Sheet (VRDS) that will be completed.

3.3 TEST CONDITIONS

3.3.1 Test Conduct Ground Rules

The rules as defined in the following subparagraphs will be followed during all test activities.

3.3.2 Roles And Responsibilities

The Test Conductor is responsible for the overall management and integration of all verification testing at the systems level. The Test Conductor is responsible for the safe, successful control and conduct of all testing. The Test Conductor will ensure all test team members are knowledgeable of the subsystems required for the verification test to be performed. The conductor acquires and assigns test resources and is responsible for the adequacy of test documentation. Additional responsibilities are:

- Test schedule coordination
- Test resource management
- Assurance of efficient test conduct
- Data and reports coordination

The Test Engineer is responsible for conducting the specific verification testing, including the coordination of test materials and personnel. The Test Engineer provides the test configuration, test plan and required paperwork/procedures. The Test Engineer is the principal technical

focal point for a given test. The Test Engineer coordinates all test data processing and supports the Test Conductor in the preparation of the post test report.

The Facility Engineer is responsible for ensuring that the required instrumentation is calibrated, installed and conditioned to provide the data necessary to meet the test objectives. The Facility Engineer is responsible for the coordination of certified Test Technician/Test Operator support.

The Test Technician/Test Operator is responsible for selection, setup, operation, maintenance and configuration of the test equipment in accordance with the approved test plan and procedure.

3.3.2.1 Test Area Requirements

Special emphasis is to be given to testing flight articles. The following rules will be incorporated into test documentation and compliance is the responsibility of all test team members. Repeated non-compliance may be grounds for denial of access to the test facility.

3.3.2.2 Test Area Cleanliness

N/A

3.3.2.3 Test Area Access

Access to all test areas shall be limited during test operations. Only essential personnel shall be admitted. The test area, surrounding test consoles, and test instrumentation shall be controlled to restrain visitors and prevent tampering with the test article or test equipment. Determination of essential personnel will be made by the Test Conductor or Test Engineer, and enforced by the Facility Engineer.

3.3.2.4 Work Area Rules

The following work rules shall be observed for the duration of testing:

- All work stands shall have toe boards sufficient to prevent any item from being accidentally dropped into a test article.
- All work stands shall have the side accessing the test article padded to prevent test article damage in the event the stand comes in contact with the test article.
- Rings and watches must be taped or removed.
- Hard hats must be worn by personnel during forklift operations.
- Forklift operations shall be limited to certified operators only.

3.3.2.5 Temporary Configuration Changes

Temporary changes to the Test Article configuration will be accomplished and documented as described in document NT1-ADM-012 TPS NT/Occupational Safety and Institutional Assurance Division.

4.0 TPS AUTHORIZED PERSONNEL

The TPS Authorization is comprised of two (2) types:

- Type A – A Task Performance Sheet that changes the temporary or permanent configuration of the “Flight” (Class I) or Ground Support Equipment (GSE) test hardware. These documents must be reviewed and agreed upon by the customer before obtaining a NASA Signature. Absolutely no work is to be performed without having the proper paperwork in hand with the appropriate signatures.
- Type B – A Task Performance Sheet that does not change the configuration of the hardware which is being tested. These documents do not require a NASA Signature, and are to be coordinated with the customer and submitted for signature.

All documents must have the signature of the Lockheed Martin engineer authority in charge of verification.

If documents require hardware to be pulled out of bond; the appropriate signature authority for the bond room must be included. This list is for reference purposes only, verify before use. The official list is provided in NASA EA5 memo.

LIST OF AUTHORIZED SIGNATURES

Project ID	Project Name	New Project ID	New Project Name	NASA Technical Monitor	Mission Assigned	Other Authorized Signatures
HPMHPMS1	Integration Hardware Definition & Development/Ground Rack Design and Build	HPMS	High Fidelity Mockup/Ground Development Facility/Launch Integration Facility/Payload Rack Checkout Unit	Ed Strong	HRF	Sharad Bhaskaran Robert Henneke Brian Rhone Bob Trittipio Tom Wiggins Elton Witt
HPM1	Ground Facilities Development	Deleted – Content moved to HPMS				
HPM3	Water Cooled Rack Development	HPM3	Flight Prototype Rack Integration/Flight Rack Integration	Ed Strong	HRF	Carlos Aquilar Sharad Bhaskaran Todd Leger Brian Rhone Kevin Upham
HPCP	HRF Launch Package 1 Hardware Design	Deleted – Content moved to HPM3				
MEIT	Multiple Element Integration Test (MEIT)	Deleted – Content moved to HPM3				

5.0 TEST SET UP

The test setup and tear down will be governed by TPS JSC Document 1225. Test configuration will be assembled per Figure B-1 in the JSC Building 14 EMI Testing Facility.

5.1 PRE-TEST ACTIVITY

5.1.1 Required Equipment

The equipment in the following table is essential to the unloading, transportation and operation of the HRF Rack in JSC Building 14.

TABLE 5.1 REQUIRED EQUIPMENT

Part Number	Nomenclature	Qty
N/A	Flat Head Screwdriver	1
N/A	Phillips Head Screwdriver	1
N/A	3/4" - 3/8" Deep Drive Well Socket	1
N/A	9/16 - 3/8" Drive Socket	1
N/A	7/16" Open End Wrench	1
N/A	Crescent Wrench (1" spread)	1
McMaster-Carr 85555A41	Torque Wrench (3/8" Drive), 5 to 75 ft-lbs, 0.5 ft-lbs G	1
N/A	3/8" Drive Ratchet	1
N/A	1/2" External Hex Head Wrench	1
N/A	1/2" - 3/8" Drive Socket	1
M25083 (OR Equiv.)	Static Ground Jumper	1
MG2114	MAG 2000 Key Vendor: (Media Recovery, Inc.)	1
N/A	Masking Tape, Roll	1
N/A	Marker, (Sharpie)	1
N/A	6' Step Ladder (or equiv.)	1
TBD	OHM Meter	1
N/A	Tape Measure	1
N/A	Level	1
Model 155F	Heartwatch, Media Recovery, Inc.	1
MAG2000	3.5, HH, A, Shock Limit Indicator	2
MAG2000	3.5, VV, A, Shock Limit Indicator	2
MIL-D-3464, Type 2	Desiccants	30
TA378-HC-MHI	Humidity Indicators, ACM	1
N/A	6,000 lbs (minimum) Forklift (72" forks)	1
HX-300	Recirculating Chiller	1
N/A	Power Supply	1
683-21440-1	Suitcase Test Environment for Payloads (STEP)	1
SEZ38116529-301	Thermal Supply Hose Assy	1
SEZ38116530-301	Thermal Return Hose Assy	1
SEZ38116516-301	Power Cable Assy	1

5.1.2 Transportation of HRF Rack

The HRF Rack is to be loaded (JSC Building 241) and unloaded (JSC Building 14) per LS71139-1 document Section 6.0. Once the HRF Rack has been removed from the HRF Rack Shipping Container (RSC) per LS71139-1 Section 6.3, the HRF Rack will be maneuvered into the EMI chamber. The forklift will be used to support the HRF Rack in preparation of attachment to the base.

5.1.3 Connection of GSE

The STEP must be connected to the HRF Rack to initiate commanding and data handling. The following matrix details the connection of the STEP system and the interface cable used to perform this task.

TABLE 5.2 STEP CONNECTIONS

Sun Workstation	Cable Assy SK683-21445-1	I/O Chassis
J0	W1-1-P1 M/W CS-J0	
J1	W1-2-P2 M/W CS-J1	
J2	W1-3-P3 M/W CS-J2	
	W1-1-P4 M/W I/O-J1	J1 Internal
	W1-2-P5 M/W I/O-J3	J3 P/L LAN 1
	W1-3-P6 M/W I/O-J6	J6 P/L LAN 2

The HRF Rack is connected to the STEP I/O Chassis using the following point-to-point configuration. Actual test set-up may require the addition of Class III jumpers and/or extension cabling. Deviations are to be noted on the "Set-up" TPS.

TABLE 5.3 HRF RACK TO STEP I/O CHASSIS

HRF Rack	Interface Cable	I/O Chassis
J46	P1 M/W J46...LAB LAN-1	J4 P/L LAN 1
J47	P1 M/W J47...LAB LAN-2	J7 P/L LAN 2
J7	P1 M/W J7...TX TO APS (DATA OUT)	J13-RX HRDL
J3	P1 M/W J3...BUS A	J19 1553 CH-A Stub
J4	P1 M/W J4...BUS B	J20 1553 CH-B Stub
-	PASS-1000	J17 1553 CH-A Stub

Power and thermal connections are necessary in accompaniment with the STEP for operation of the HRF Rack. Actual test set-up may require the addition of Class III jumpers and/or extensions. Deviations are to be noted on the TPS written for set-up activities.

TABLE 5.4 RACK CONNECTIONS

HRF Rack	Connections
P1	SEZ38116516-301
Thermal Supply	SEZ38116529-301
Thermal Return	SEZ38116530-301

Prior to operation of the chiller, open the top and inspect all electrical and plumbing connections. Before powering up, the unit must be connected to its power source for at least twelve (12) hours, allowing time for the compressor oil to be heated and separate from the refrigerant. The GSE thermal supply and return hoses must be primed with station water before connecting to the HRF Rack.

5.2 POST-TEST ACTIVITY

The HRF Rack is to be loaded (JSC Building 14) and unloaded (JSC Building 241) per LS71139-1 document Section 6.0. The forklift and HRF Rack will be positioned so that the HRF Rack can be disassembled from the Rack Handling Base while in the EMI chamber. After the base has been removed, the Rack Handling Adapter (RHA) along with the HRF Rack will be placed in the RSC.

6.0 TEST PROCEDURE

6.1 HRF RACK ACTIVATION/DEACTIVATION

The following sequence provides the necessary steps to activate and deactivate the HRF Rack using the STEP and essential thermal and power supplies.

6.1.1 Activation

The STEP provides the basic C&DH functions necessary for operation of the HRF Rack. The HRF Rack must have an external source to provide thermal and power support whenever placed in a test configuration with the STEP. The STEP does not monitor the thermal and power values from the HRF Rack. These values must be monitored using the EXPRESS Laptop or the ground support equipment itself.

TABLE 6.1 HRF RACK ACTIVATION

Step	GSE Support	HRF Rack	Payload
1.	STEP Wrkstn Verify the following: STEP Wrkstn - off Virtual Machine Environ- ment (VME) Chassis - off		
2.	STEP Wrkstn, Power on the following: Monitor - on Tape Drive - on Computer Processor Unit (CPU) - on Verify login is displayed on screen		
3.	STEP VME Chassis (rear) Main pwr - on		
4.	STEP Wrkstn, Login User: "step" <Return> Password: "step" <Return>		
5.	STEP Desktop Select: "Console" icon Verify "cmdtool (Console) window appears		
6.	STEP Desktop "cmdtool (Console)" window Type: stepgo <Return> Verify Labview boot up executed		
7.	STEP Wrkstn, "STEP Active Session" Select: "MDM DATA DEFINITION" button		
8.	STEP Wrkstn, "MDM Data Definition" Select: "PCDT" button		
9.	STEP Wrkstn, "Payload Configuration Data Table" Select: File Operations "OPEN" button		

TABLE 6.1 HRF RACK ACTIVATION (CONT'D)

Step	GSE Support	HRF Rack	Payload
10.	STEP Wrkstn, "File Dialog" Select: "HRF_FR1" file folder Select: "SELECT" button		
11.	STEP Wrkstn, "Payload Configuration Data Table" Select: "CONFIGURE ALL" button Wait thirty (30) seconds Select: "CLOSE" button		
12.	STEP Wrkstn, "MDM Data Definition" Select: "INITIALIZE 1553" button		
13.	STEP Sun Wrkstn, " Initialize 1553" Primary Bus: BUS A Bus ID: LB PL-4 RT ID: 10 Connector Type: Commercial Select: Bottom "CONFIGURE" button Wait sixty (60) seconds Select: "CLOSE" button		
14.	STEP Wrkstn, "MDM Data Definition" Select: "PAYLOAD COMMANDS" button Verify files are loaded		
15.	STEP Wrkstn, "STEP Active Session" Select: "PEHG" button		
16.	STEP Wrkstn, "PEHG Menu" Select: "PEHG CONFIGURATION" button		
17.	STEP Wrkstn, "PEHG Configuration" PEHG: 1 Gateway ENABLE: ENABLE Ethernet Address: 0 40 BE 80 20 0 Select: Bottom "CONFIGURE" button PEHG: 2 Gateway ENABLE: ENABLE Ethernet Address: 0 40 BE 80 20 1 Select: Bottom "CONFIGURE" button Select: "CLOSE" button		
18.	STEP Wrkstn, "PEHG Menu" Select: "RETURN" button		
19.	STEP Sun Wrkstn, "STEP Active Session" Select: "SESSION COMMANDS" button		
20.	STEP Wrkstn, "Session Commands" Select: "SET SIMULATION TIME" button		
21.	STEP Wrkstn, "Simulation Time" Verify/Set current time Select: "SET SIMULATION START TIME" button		

TABLE 6.1 HRF RACK ACTIVATION (CONT'D)

Step	GSE Support	HRF Rack	Payload
22.	STEP Wrkstn, "Session Commands" Select: "START SIMULATION TIME" button Select: "DISPLAY SIMULATION TIME" button		
23.	STEP Wrkstn, "Display Simulation" Verify current time Select: "CLOSE"		
24.	STEP Wrkstn, "Active Session" Select: "DATA LOGGING" button Verify "Data Logging" window appears		
25.	STEP Wrkstn, "Data Logging" Select: "COMMANDS" button Verify "Logging Commands" window appears		
26.	STEP Wrkstn, "Logging Commands" Select: "Reset Log File" button Select: "Open Log File" button Select: "Global Log Enable" button Payload Commands: ENABLE PEHG1: ENABLE PEHG2: ENABLE NOTE: "ENABLE" all appropriate logging functions needed for this session.		
27.	STEP Wrkstn, "Logging Commands" Select: "Return" button		
28.	STEP Wrkstn, "Data Logging" Select: "Return" button		
29.	STEP Wrkstn, "Session Commands" Select: "SIMULATION START" button Select: "VIEW TASK STATUS" button		
30.	STEP Wrkstn, "Task Status" Select: "SNAPSHOT" button Verify Nominal Status: <ul style="list-style-type: none"> Simulation Start 1553 I/O Initialization Complete 1553 Bus Active NOTE: All other appropriate logging functions are running.		
31.	STEP Wrkstn, "Task Status" Select: "CLOSE" button		
32.	STEP Wrkstn, "Session Commands" Select: "RETURN" button		
33.	STEP Wrkstn, "MDM Data Definition" Select: "MDM SERVICES" button		

TABLE 6.1 HRF RACK ACTIVATION (CONT'D)

Step	GSE Support	HRF Rack	Payload
34.	STEP Wrkstn, "Payload MDM Services" Select: "RIC" Index Select: "STARTUP NOTIFICATION" button Select: "CLOSE" button		
35.	STEP Wrkstn, "MDM Data Definition" Select: "RETURN" button		
36.	STEP Wrkstn, "STEP Active Session" Select: "MDM DATA DISPLAY" button		
37.	STEP Wrkstn, "MDM Data Display" Select: "PAYLOAD H & S" button		
38.	STEP Wrkstn, "Health & Status..." Select: "CONT ALL INDEXES" button NOTE: At any time during the test, this action may be repeated as necessary.		
39.	Moderate (Mod) Temp Chiller Verify the following: Power has been off for > 5 mins H2O is within "Spec"		
40.	Moderate (Mod) Temp Chiller Verify the following: <ul style="list-style-type: none"> Power has been off for > 5 mins H₂O is within "Spec" 		
41.	Mod Temp Chiller, top panel Verify the following: <ul style="list-style-type: none"> Vent is not obstructed H2O level is above top coil 		
42.	Mod Temp Chiller, right side panel Verify the following: <ul style="list-style-type: none"> RFC valve is closed Pressure Reducer Valve is closed 		
43.		IFR, lower front panel Verify the following: <ul style="list-style-type: none"> Mod temp supply hose is connected Mode temp return hose is connected 	
44.	Mod Temp Chiller, front panel Place main pwr sw - on Record Activation time in Log Book Verify the following: <ul style="list-style-type: none"> "Temperature Centigrade" LED is on Depress: "SETPOINT/ACTUAL TEMP" button Set Value: 17°C To Set Value rotate "Adjust" dial while depressing "SETPOINT/ACTUAL TEMP" button NOTE: This temperature must be monitored continually for the duration of the test.		

TABLE 6.1 HRF RACK ACTIVATION (CONT'D)

Step	GSE Support	HRF Rack	Payload
45.	Mod Temp Chiller, right side panel RFC Valve - open NOTE: RFC Valve must be opened gradually by rotating clockwise. Monitor the pressure gauge to obtain desired flow rate. Do not exceed 1 GPM.		
46.	Mod Temp Chiller, right side Pressure Reducer Valve - open NOTE: Valve should be opened by rotating handle ½ turn clockwise.		
47.		HRF Rack Thermal Connectors Supply valve - open Return valve - open	
48.	Mod Temp Chiller Pressure Reducer Gauge Monitor Flow rate If necessary adjust valve. NOTE: This step may be performed as needed to maintain adequate thermal flow in HRF Rack.		
49.	Activate Power to HRF Rack		
50.		Activate EXP Laptop per LS-71139-5 Section 6.0.	
51.	STEP Wrkstn, "Payload Command Table" Select: "RIC" Index Select: "RICRackTLM_CFG" Select: "SEND SELECTED" button Select: "RIC_PEBB_LANCAM" Select: "SEND SELECTED" button Select: "RIC_ISS_LAN1" Select: "SEND SELECTED" button Select: "RICStartLinkAll" Select: "SEND SELECTED" button Select: "RICMode_Operate" Select: "SEND SELECTED" button		

TABLE 6.1 HRF RACK ACTIVATION (CONT'D)

Step	GSE Support	HRF Rack	Payload
52.	<p>STEP Wrkstn, "Payload Command Table"</p> <p>Select: "Payload_X" Index</p> <p>Select: "PLDX_Add_PLDCFG</p> <p>Select: "SEND SELECTED" button</p> <p>Select: "PLDX_CFG_XXXXX"</p> <p>Select: "SEND SELECTED" button</p> <p>Select: "PLDX_Add_TLMCFG"</p> <p>Select: "SEND SELECTED" button</p> <p>Select: "PLDX_TLMCFG_XR"</p> <p>Select: "SEND SELECTED" button</p> <p>Select: "PLDX_Comm_ON"</p> <p>Select: "SEND SELECTED" button</p> <p>Select: "PLDX_Power_ON"</p> <p>Select: "SEND SELECTED" button</p> <p>NOTE: This step may be repeated or omitted as necessary for drawer locations 1 thru 15 depending upon the HRF Rack configuration.</p>	<p>EXP Laptop, Change IP Address of Payload Configurations to coincide with RIC IP Address (10.12.12.XXX to 120.80.10.XXX)</p> <p>NOTE: This STEP will be performed as necessary to support configuring a payload location for Ethernet.</p>	
53.	<p>STEP Wrkstn, "Payload Command Table"</p> <p>NOTE: Wait until initial flow valve movement is complete before sending this command.</p> <p>Select: "RIC" Index</p> <p>Select: "FullValveOpen"</p> <p>Select: "SEND SELECTED" button</p> <p>NOTE: Wait until flow valve movement is complete before powering on any payloads. (Approximately sixty (60) minutes.)</p>		

T: ____ QA: ____

6.1.2 Deactivation

TABLE 6.2 DEACTIVATION

Step	GSE Support	HRF Rack	Payload
1.		Deactivate EXP Laptop per LS-71139-5 Section 6.0	
2.	Deactivate Power to HRF Rack		
3.	STEP Wrkstn, Desktop Close all active windows		
4.	STEP Wrkstn, Desktop Select: <Right Click> Select: "EXIT"		
5.	STEP Wrkstn Confirmation dialog box Select: "EXIT"		

TABLE 6.2 DEACTIVATION (CONT'D)

Step	GSE Support	HRF Rack	Payload
6.	STEP Wrkstn Desktop <u>At Logon:</u> Type: root <Return> Password: yusingXX <Return> <u>At # prompt:</u> Type: shutdown <Return> <u>At "Do you want to continue?"</u> <u>prompt:</u> Type: y <Return> NOTE: The XX in the password field represents the tracking number of the STEP (01, 02, etc.)		
7.	STEP Wrkstn Power off the following: Monitor - off CPU - off Tape Drive - off		
8.	STEP VME Chassis (rear) Main pwr - off		
9.		HRF Rack, Thermal Connectors Return Valve - closed Supply Valve - closed	
10.	Mod Temp Chiller, right side Pressure Reducer Valve - closed RFC - closed		
11.	Mod Temp Chiller, front panel Place main pwr sw - off Verify the following: <ul style="list-style-type: none"> "Temperature Centigrade" LED is off 		

T: ____ QA: ____

6.2 EMI TEST SCENARIOS

This section describes the various schema which will be used during EMI testing of the HRF Rack. An initial test will be conducted once the HRF Rack has been activated.

The following configurations will be utilized during testing:

- HRF Rack Avionics
- HRF Rack Workstation
- HRF Rack Ultrasound
- HRF Rack Gas Analyzer System For Metabolic Analysis Of Physiology (GASMAP)
- HRF Rack Cooling Stowage Drawers
- HRF Rack Workstation, Ultrasound, GASMAP, and Cooling Stowage Drawer

6.2.1 HRF Rack Avionics

Once the HRF Rack has been activated, EMI test data will be collected and assessed.

TABLE 6.3 HRF RACK AVIONICS

Step	GSE Support	HRF Rack	Payload
1.		Activate HRF Rack per LS-71139-6 Section 6.1	
2.	Perform the following EMI Tests per SSP 30238 Rev. C		
3.		Reserved	
4.		Deactivate HRF Rack per LS-71139-6 Section 6.1	

T: ____ QA: ____

6.2.2 Workstation

The Workstation payload will be powered on and tested to determine the effects of the payload. Workstation self tests may be executed during the EMI test to exercise Workstation capabilities. Exception #1 details the use of medium rate telemetry and may be omitted at the test conductor's discretion.

TABLE 6.4 WORKSTATION

Step	GSE Support	HRF Rack	Payload
1.		Activate Workstation per LS-71139-5 Section 6.0	
2.			HRF Wrkstn, "Windows" desktop, Press: <Ctrl-Alt-Delete>
3.			Logon Window: User: Type "Administrator" Password: Type "hrf" Select: "OK" button
4.			HRF Wrkstn, Windows Desktop: navigate to : Start/Program/Wrkstn
5.			HRF Wrkstn Main Menu Select: "INDIVIDUAL TESTS" button (Select Test at discretion of Test Conductor) Execute Selected Test
	Start Exception #1		
6.	Perform the following EMI Tests per SSP 30238 Rev. C		
7.			HRF Wrkstn, "HRF" Desktop, Select: "Downlink" button

TABLE 6.4 WORKSTATION (CONT'D)

Step	GSE Support	HRF Rack	Payload
8.			HRF Wrkstn "HRF Downlink" window, Select: All Files Select: "Inhibit" button Select: Appropriate File(s) for downlink Select: "Enable" button Select: "Telemetry Control..." button NOTE: Disregard "Unable to Modify" dialog box for "Sent" files when attempting to enable or inhibit.
9.			HRF Wrkstn, "HRF:downlink: Telem" window, Select: "Start Telemetry" button
10.			HRF Wrkstn, "Start Telemetry?" dialog box Select: "YES" NOTE: These steps may be repeated as necessary.
11.			The following steps are performed to "refresh" the files for downlink.
12.			HRF Wrkstn, "HRF" Desktop, Select: "System Tools" button Select: "HRF Maintenance" button
13.			HRF Wrkstn, "HRF Maintenance" window, Select: "Quit File Manager" button
14.			HRF Wrkstn, "Quit File Manager?" dialog box Select: "YES"
15.			HRF Wrkstn, "HRF" Desktop, Select: "Accessories" button Select: "Explorer" button
16.			HRF Wrkstn, "Exploring" window Navigate to: c:/hrf_prog_files/csw/downlinklist Delete Selected "downlink list" file only
17.			HRF Wrkstn, "Confirm File delete" dialog box Select: "YES" Navigate to: c:/hrf_data Rename all files starting with "dlk_(filename) to (filename) only
18.			HRF Wrkstn, "Exploring" window Select: "Close"
19.			HRF Wrkstn, "HRF Maintenance" window Select: "Launch File Manager" button Select: "YES"
20.			HRF Wrkstn, "HRF Maintenance" window Select: "Cancel" button
	End Exception #1		
21.	Perform the following EMI Tests per SSP 30238 Rev. C		
22.		Deactivate Workstation per LS-71139-5 Section 6.0	

T: ____ QA: ____

6.2.3 Ultrasound

Activate the Ultrasound after powering the HRF Rack. The EMI tests during this sequence include information from the Ultrasound and HRF Rack Avionics procedures. Scenarios may or may not include the use of the HRF Monitor and/or Ultrasound Wand.

TABLE 6.5 ULTRASOUND

Step	GSE Support	HRF Rack	Payload
1.			Attach Ultrasound Scanhead arrows pointing upward to middle port of Ultrasound unit. NOTE: Step may be omitted at discretion of Test Conductor.
2.		Activate Ultrasound per LS-71139-5 Section 6.0	
3.			HRF Monitor - Ultrasound Live sw
4.			Ultrasound, Front Panel Video Tape Recorder - on Verify LED is illuminated green NOTE: Wait approximately two (2) minutes.
5.	Perform the following EMI Tests per SSP 30238 Rev. D		
6.			Ultrasound, Front Panel Video Tape Recorder pwr - off
7.		Deactivate Ultrasound per LS-71139-5 Section 6.0	

T: ____ QA: ____

6.2.4 GASMAP

Activation of the GASMAP payload initializes the internal Ion and Cathode pumps.

TABLE 6.6 GASMAP

Step	GSE Support	HRF Rack	Payload
1.		Activate GASMAP per LS-71139-5 Section 6.0	
2.			GASMAP, Keypad Select: <4> "operate" Select: <1> "default" Verify the following: • Screen displays ambient samples
3.	Perform the following EMI Tests per SSP 30238 Rev. C		
4.		Deactivate GASMAP per LS-71139-5 Section 6.0	

T: ____ QA: ____

6.2.5 Cooling Stowage Drawers

This sequence simulates on-orbit use of the Cooling Stowage Drawers.

TABLE 6.7 COOLING STOWAGE DRAWERS

Step	GSE Support	HRF Rack	Payload
1.		Activate Cooling Stowage Drawers per LS-71139-5 Section 6.0	
2.	Perform the following EMI Tests per SSP 30238 Rev. C		
3.		Deactivate Cooling Stowage Drawers per LS-71139-5 Section 6.0	

T: _____ QA: _____

APPENDIX A

JSC Forms

For reference purposes only.

		5. Page of	
TASK PERFORMANCE SHEET CONTINUATION PAGE NASA - LYNDON B. JOHNSON SPACE CENTER		4. TPS NO.	
		6. MOD NO.	
20. OPER SEQ. NO.	21. OPERATIONS <i>(Print, Type, or Write Legibly)</i>	VERIFICATION	
		22. TECH.	23. QA/DV

JSC Form 1225A (Rev February 7, 2000) (MS Word August 1996)

Figure A-2 Task Performance Continuation Sheet

1. JPIC		Discrepancy Report/Material Review Record NASA - Lyndon B. Johnson Space Center				2. Page 1 of ____	
3. Ref Doc #		4. INR #		5. DR #			
6. Name of Top Assy.		7. Drawing or P/N		8. S/N or Lot #		9. Qty.	
10. Name of Sub Assy		11. Drawing or P/N		12. S/N or Lot #		13. Qty.	
14. Name of Component		15. Drawing or P/N		16. S/N or Lot #		17. Qty.	
18. Description of nonconformance							
19. Initiator's name (print and sign)		20. Title/Stamp No.		21. Org.		22. Location	
						23. Date	
24. Responsible Engineer/Mail Code		25. CHRP Code		26. CAGE Code		27. Time/cycles used	
xx. Category		29. PRACA Reportable		30. Configuration Change?		31. Waiver?	
<input type="checkbox"/> Critical		<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	
<input type="checkbox"/> Major						<input type="checkbox"/> Yes <input type="checkbox"/> No	
<input type="checkbox"/> Minor		FIAR # _____		DCN # _____		Waiver # _____ CAS # _____	
33. Final Disposition				34. MRR Rec'd?		35. Final Acceptance Stamp and	
<input type="checkbox"/> Rework <input type="checkbox"/> Repair <input type="checkbox"/> Change Classification <input type="checkbox"/> Scrap <input type="checkbox"/> Use-as-is <input type="checkbox"/> Return to vendor/supplier <input type="checkbox"/> Written in error				<input type="checkbox"/> Yes <input type="checkbox"/> No			
Material Review Board <small>(anonymous must be typed or printed and signed)</small>							
36. Stress Engineer		Date		37. Materials Engineer		Date	
38. Project Engineer		Date		39. Quality Engineer		Date	
40. Other (print or type title)		Date		41. QA Rep. (NASA)		Date	
T1 Resp. Org. T2 HW Type T3 Prev. Cond. T4 Fail. Mode T5 Defect T6 Remedial Act. T7 Cause T8 Recur. Ctrl. T9 Perf. Org. T10 Proc. Flow							
JSC Form 2176 (Rev August 10, 1999) (MS Word Sep 97)							

Figure A-3 Discrepancy Report/Material Review Record

1. IDR # _____	Discrepancy Report/Material Review Record NASA - Lyndon B. Johnson Space Center	3. Page ____ of ____
2. DR # _____		
Continuation Sheet		
4. Insp. Pts.	5. Seq. No.	7. Verification Stamps
6. Instructions <i>(Print, type, or write legibly)</i>		Tech. Qual.
8. Final Acceptance Stamp and Date		
JSC Form 2176A (Sep 97) (MS Word Sep 97)		

Figure A-4 Discrepancy Report/Material Review Record Continuation Sheet

1. DR #	Discrepancy Report/Material Review Record		2.
	NASA - Lyndon B. Johnson Space Center		Page ____ of ____
Summary Sheet			
3. Configuration Change?		4. CCBD #	5. PRACA #
<input type="checkbox"/> No <input type="checkbox"/> Yes DCN #			
6. Remedial Action			
7. Root Cause			
8. Corrective Action (Recurrence Control)			
MRB APPROVAL			
9. Stress Engineer (Print and sign)		10. Materials Engineer (Print and sign)	Date
11. Project Engineer (Print and sign)		12. Quality Engineer (Print and sign)	Date
13. Other (Print and sign)		14. QA Rep. (NASA) (Print and sign)	Date
JSC Form 2176B (Oct 97) (MS Word Sep 97)			

Figure A-5 Discrepancy Report/Material Review Record Summary Sheet

1. DR #	Discrepancy Report/Material Review Record NASA - Lyndon B. Johnson Space Center	2. Page ____ of ____							
Multiple Disposition Coding Sheet									
A.									
T1 Resp. Org.	T2 HW Type	T3 Prev. Cond.	T4 Fail. Mode	T5 Defect	T6 Remedial Act.	T7 Cause	T8 Recuf. Ctrl.	T9 Perf. Org.	T10 Proc. Flow
B.									
T1 Resp. Org.	T2 HW Type	T3 Prev. Cond.	T4 Fail. Mode	T5 Defect	T6 Remedial Act.	T7 Cause	T8 Recuf. Ctrl.	T9 Perf. Org.	T10 Proc. Flow
C.									
T1 Resp. Org.	T2 HW Type	T3 Prev. Cond.	T4 Fail. Mode	T5 Defect	T6 Remedial Act.	T7 Cause	T8 Recuf. Ctrl.	T9 Perf. Org.	T10 Proc. Flow
D.									
T1 Resp. Org.	T2 HW Type	T3 Prev. Cond.	T4 Fail. Mode	T5 Defect	T6 Remedial Act.	T7 Cause	T8 Recuf. Ctrl.	T9 Perf. Org.	T10 Proc. Flow
E.									
T1 Resp. Org.	T2 HW Type	T3 Prev. Cond.	T4 Fail. Mode	T5 Defect	T6 Remedial Act.	T7 Cause	T8 Recuf. Ctrl.	T9 Perf. Org.	T10 Proc. Flow
F.									
T1 Resp. Org.	T2 HW Type	T3 Prev. Cond.	T4 Fail. Mode	T5 Defect	T6 Remedial Act.	T7 Cause	T8 Recuf. Ctrl.	T9 Perf. Org.	T10 Proc. Flow
3. Quality Engineer (Print and Sign)						Date			
JSC Form 2176C (Oct 97) (MS Word Oct 97)									

Figure A-6 Discrepancy Report/Material Review Record Multiple Disposition Coding Sheet



FLASH REPORT

For Safety and Product Assurance use only

NASA mishap no.	
OSHA file no.	
GENERAL INFORMATION	
1. Date (MM/DD/YY)	2. Time <input type="checkbox"/> a.m. or <input type="checkbox"/> p.m.
3. Building number/location	4. Specific area
5. Category of incident (check appropriate box)	
<input type="checkbox"/> Injury/accident <input type="checkbox"/> Fire <input type="checkbox"/> Auto accident <input type="checkbox"/> Explosion <input type="checkbox"/> Chemical spill <input type="checkbox"/> Other	
6. Description of incident (explain what happened, including cause or description of failure)	
7. SEAT involvement (name of organization)	
PERSONNEL INVOLVED	
8. Name (last, first, middle initial)	9. Telephone
CONTACT PERSON	
10. Name (last, first, middle initial)	11. Telephone

FORM SEAT 094 (09/23/97)

Figure A-7 Flash Report

**DISPOSAL INVENTORY
FOR MISCELLANEOUS HAZARDOUS WASTES**

GENERAL NOTES:

1. Waste sources must be identified.
2. Exceptions:
See JSCI 8837 (current issue) for disposal methods for batteries, ether, explosives, empty drums, paint and chemical containers, radioactive and biological wastes, and precious metals.
3. Containers must be waterproof.
4. Containers must be labeled; all unlabeled containers will be returned to generators for proper identification.
5. For pickup, call x32038

TO BE COMPLETED BY WASTE GENERATOR.

DATE
BUILDING NO.
ROOM NO.
NAME
PHONE EXTENSION
MAIL CODE
CARTON NO. _____ OF _____
Provide the following information at time of pickup: PICK-UP TICKET NO.:

INVENTORY

*(Use a separate form for each carton of waste.
A copy of Inventory must be in or on each carton.)*

IDENTIFICATION AND SOURCE OF WASTE	AMOUNT	IDENTIFICATION AND SOURCE OF WASTE	AMOUNT

JSC Form 1161 (Rev Aug 97) (MS Word Aug 97)

COPY 1 - SHIPPING

COPY 2

COPY 3 - ORIGINATOR

Figure A-8 Disposal Inventory for Miscellaneous Hazardous Wastes

APPENDIX B

Illustrations

DISTRIBUTION
FOR LS-71139-6A

NASA/JSC

EA5/L. Bauer

EA5/E. Strong

NT3/GFE Assurance Branch

SF/D. Grounds

LOCKHEED MARTIN

C20/G. Harvey

C42/M. Gerlach

C64/S. Fetzer

C64/R. Henneke

C64/D. Reed

C64/R. Trittippo

C64/T. Wiggins

S03/D. Babic

S03/P. Miller

S03/J. Searcy

S03/Science Payloads Library

S18/J. Hoge

S18/M. Klee

S18/G. Salinas

S22/D. Barineau

S22/S. Bhaskaran

S22/R. Brown

S22/S. Ezell

S22/R. Ezell

S22/R. Gonzales

S22/K. Lajaunie

S22/T. Leger

S22/C. McGee

S22/B. Rhone

S22/S. Tarver

S22/M. Trenolone (3)

S22/K. Upham

S22/E. Witt

S361/J. McDonald

S362/STI Center/Bldg. 36 (3)

S56/G. Geissen